

In the churchyard, another Stevenson screen has been fixed containing a similar set of thermometers, for comparison with those above. All the thermometers will be read every morning at nine o'clock. The electrical thermometer consists of a coil of wire wound round a cylindrical piece of wood inclosed in a small brass tube, a third wire is joined to one of the wires, and the three insulated by gutta-percha, form a light cable which is brought down to the base of the tower and connected to a galvanometer, the terminals of which are in connection with the two poles of a six-cell Leclanché galvanic battery. The instrument is read by depressing a key, which causes the needle of the galvanometer to deflect; a pointer or vernier (moving a contact roller upon a wire in a circular groove) is then pushed to the right or to the left upon a divided scale until the needle remains stationary on the zero point, when the electrical resistance of the wire is measured upon the scale. The number indicated by the vernier is then read off, and by referring to a table of equivalents the actual temperature in degrees of Fahrenheit is readily ascertained. Simultaneous readings of the electrical thermometer at the summit of the tower and of the dry bulb thermometer in the churchyard will be made frequently during the day by the verger of the church.

A RUSSIAN naval officer has invented a very ingenious apparatus for ascertaining the depth of the sea without the use of a costly and heavy line. Indeed, no line at all is used. The instrument consists of a piece of lead, a small wheel with a contrivance for registering the number of revolutions, and a float. While the apparatus sinks, the wheel revolves, and the registered revolutions indicate the depth. When the bottom is reached, the lead becomes detached, the float begins to act, and the machine shoots up to the surface, where it can easily be fished up by a net and the register read off.

PROF. WEGMÜLLER, the eminent Munich sculptor, is hard at work at the monument of Baron Justus von Liebig, the eminent chemist, which will be erected in the Public Gardens at the Maximilian's platz of Munich. It is of Carrara marble and over life size.

THE enterprising people of Paisley, near Glasgow, are to have a popular observatory attached to their Free Library and Museum, mainly through the liberality of Mr. Thomas Coats, who, with the assistance of Prof. Grant, of Glasgow, has not only purchased a suitable equatorial with all necessary adjustments, and a cupola, but is erecting a tower for the reception of the instrument. Similar institutions in the provinces might take a hint from Paisley.

M. DE FREYCINET, the French Minister of Public Affairs, has declared himself a candidate for the next election to the Academy of Sciences, to fill the seat vacated by M. de Bussy's recent death. His claim is grounded on the publication of books relating to engineering and the integral calculus. M. Paul Bert, the late Minister of Public Instruction is also offering himself for election, but in the section of Surgery and Medicine.

BAEYER, in continuing his investigations on indigo (*Berichte*, xv. 50), arrives at probable structural formulæ for the molecules of this compound and some of its derivatives. Some light has been thrown on chemical changes which occur in the manufacture of *yellow prussiate of potash* by the observation of Remsen (*Amer. Chem. Jnl.*, iii. 134), that a cyanide of iron is formed when iron, which has been reduced by hydrogen and organic matter, is heated with metallic sodium in an atmosphere of hydrogen.

THE *Panama Star and Herald* of Monday announces that an earthquake has occurred in Costa Rica, by which the towns of Alajuela, San Ramon, Grecia, and Heredia have been destroyed. It was at first stated that several thousand persons had perished, but according to later information, the loss has been grossly exaggerated.

FROM April 11 to 16 a Pedagogical Congress will meet at the Sorbonne, under the presidency of the French Minister of Public Instruction, who will be, as in former years, M. Ferry. The male public teachers will, as in 1881, send their delegates; but a great innovation will take place—the female teachers will for the first time enjoy the same privilege. The *Journal Officiel* has already published the programme of questions which will be discussed in this characteristic session.

MOVEMENTS of the ground appear to be now going on in the Jura. M. Girardot has lately pointed out that villages that were invisible to each other at the beginning of the century, and even thirty to forty years ago, are now visible. First the roofs appeared, then (in part) the walls. Such is the case with the villages of Doucier and Marigny, near Lake Chalain. Important changes have been observed even within ten years.

A LARGE meteorite fell at Mirotsch Planina (Eastern Servia), on February 21 last.

WE have on our table the following books:—A Monograph of the Insectivora, Systematic and Anatomical, by G. E. Dobson (Van Voorst); *Leçons sur L'Electricité et le Magnétisme*, by E. Maxart and J. Joubert (G. Masson); *The Use of Gas as a Workshop Tool*, by Thos. Fletcher, Warrington; *Contributions to Meteorology*, by Elias Loomis; *Punjab Customary Law*, 3 vols., by C. L. Tupper (Quaritch); *Geology of the Counties of England*, by W. J. Harrison (Kelly and Co.); *The Sun*, by C. A. Young (Kegan Paul and Co.); *Hesperothen*, 2 vols., by W. H. Russell (Low and Co.); *A Plea for the Rain-band*, by J. Rand Capron; *Pioneering in the Far East*, by Ludwig Verner Helms (W. H. Allen); *Ferments et Maladies*, by E. Duclaux (G. Masson); *Commercial Organic Analysis*, vol. ii., by A. H. Allen (Churchill); *Manitoba*, by Rev. G. Bryce (Low and Co.); *Electric Lighting*, 3rd edition, by Killingworth Hedges (Spon); *Blackie's Imperial Dictionary*, vol. ii.; *Preparation for Science Teaching*, by John Spanton (Griffith and Farran); *Ueber die Dauer des Lebens*, by Dr. A. Weismann (Fischer, Jena); *Die Magneto und Dynamo-elektrischen Maschinen*, by Dr. H. Schellen (Dumont-Schanberg); *Acoustics, Light, and Heat*, by N. E. William Lees (Collins); *Experimental Chemistry, Part I.*, by Prof. J. Emerson Reynolds (Longman); *Geology and Resources of the Black Hills of Dakota* (Government Office, Washington, D.C.); *Atlas to the same*; *Magnetism and Electricity*, by R. Wormell (Murby).

THE additions to the Zoological Society's Gardens during the past week include a Water Vole (*Arvicola amphibius*), British, presented by Mr. W. K. Stanley; two Common Buzzards (*Buteo vulgaris*) from Scotland, presented by Mr. W. M. Baillie; a Harrier (*Circus*, sp. inc.) from South Africa, presented by Mr. Cole; a West African Python (*Python sebae*) from West Africa, deposited; a Muscat Gazelle (*Gazella muscatensis*), born in the Gardens.

OUR ASTRONOMICAL COLUMN

VARIABLE STARS.—Prof. Julius Schmidt has published his variable-star results for 1881, which evince the same assiduity of observation as in so many years past. Seven minima of Algol were determined; the last occurred on November 27, at 11h. 8'5m. M.T. at Athens. Of Ceraski's variable U Cephei, a minimum took place May 13, at 11h. 0'2m., and one on November 26, at 9h. 4'1m.—the interval corresponding to 79 periods of 2d. 11h. 49m. 25s. A minimum of Mira Ceti (a phase of which we have comparatively few observations) occurred on March 2. χ Cygni attained a maximum July 17.0, brightness 6.5; this date is nearly three months later than the epoch assigned by Argelander's formula in the seventh volume of the Bonn Observations, as indeed has been the case for some years. For Pigott's variable R Scuti, Prof. Schmidt finds maxima at August 7.2 and October 31.2, and minima at July 4.9 and September 23.6. He has many epochs for the short-

period variables, δ Libræ, δ Cephei, β Lyræ, η Aquilæ, and ζ Geminorum.

THE TOTAL SOLAR ECLIPSE OF MAY.—The central line in the eclipse of May 17 passes near to Teheran, in which longitude the duration of totality will be within five seconds of the maximum. Taking the position of the Indo-European Telegraph Station in longitude 3h. 25m. 41.7s. east of Greenwich, and latitude $35^{\circ} 41' 7''$, as determined by the Russian General Stebnitsky, it appears that the central line will pass between nine and ten English miles south of the station. At Shanghai, the eclipse is partial, magnitude 0.996 at 5h. 21m. p.m. local mean time: the central line runs some fifteen or sixteen miles north of that place: the sun at an altitude of 17° . At the observatory of Zi-ka-Wei, the eclipse is also partial, magnitude 0.994. In Cairo, upwards of nine-tenths of the sun's diameter are covered.

GALLE'S METHOD FOR SOLAR PARALLAX.—The present year will afford two favourable opportunities of applying the method suggested by Prof. Galle for determining the sun's parallax, viz. the observation at distant stations of the minor planets when they approach near the earth. Mr. Gill has taken steps to secure such observations about the opposition of *Victoria* on August 24, and that of *Sappho* a month later. In the case of the former, the distance from the earth at opposition will be 0.891 (the earth's mean distance being taken as unity), the declination 8° N., and the magnitude 8.3; in the latter case the distance will be 0.847, the declination $12\frac{1}{2}^{\circ}$ N., and the magnitude 9.2. Ephemerides of both planets about opposition will be found in the *Berliner Astronomisches Jahrbuch* for 1883.

THE TEMPLE OBSERVATORY, RUGBY.—We have received the Report of this Observatory for the year 1881. As in former years, the principal instrument, an 8 $\frac{1}{2}$ inch refractor by Alvan Clark, has been employed on observations of double stars, and 210 complete sets of measures of distance and position were made in the past year. Mr. Seabroke, the honorary curator, with the assistance of Mr. Hodges, has completed a summary of the work in the three years 1878-80, which forms part of vol. xlv. of the *Memoirs* of the Royal Astronomical Society recently issued. Some attention has been given to the determination of the motion of approach or recession of stars, though with the double-star work and the hour each fine evening, through part of the year, devoted to members of the school, little time remains for that class of observation, more especially as the observers engaged follow their ordinary vocations during the day, and very late hours are thus precluded.

GEOGRAPHICAL NOTES

THE mail from India brings the news of the death of a very meritorious Indian servant, and one of the most remarkable of living travellers—Nain Singh, or the Pundit No. 9, as he was officially known, a hillman of the Khsettriya, or warrior caste. Nearly thirty years ago he offered his services as native assistant to that intrepid but unfortunate explorer Herr Schlagentweit. In the year 1863 he became one of the staff of trained native explorers under the orders of Col. Montgomerie of the Trigonometrical Survey, and it was in this capacity that he earned his reputation. The experience which Nain Singh had acquired with Herr Schlagentweit was held peculiarly to fit him for employment in the most interesting department of Indian geographical research—the exploration of the Trans-Himalayan regions. The success which attended his journeys beyond the great northern mountain barrier of India exceeded the expectations of even the talented officer who had specially trained him for the work. In 1866 he determined the true position of Lhasa; in 1867 he visited the celebrated gold mines of Thok Jalung, and seven years later he began his most celebrated tour of all, that through Tibet from west to east. During this he visited the capital of the Dalai Lama, took numerous observations, and threw much fresh light on the question of the Sanpu River, and whether its lower course is the Brahmapootra or not. This exploit closed Nain Singh's public career. He was awarded the Royal medal by the Royal Geographical Society, and the Indian Government granted him a small estate, where he died towards the end of last January. There have been few native Indian officials who have done more useful or more durable service than the explorer Nain Singh.

At the meeting of the Geographical Society on Monday Mr. D. W. Freshfield, the secretary, read a paper on a three months'

journey in the Makua and Lomwe countries, by Mr. H. E. O'Neill, who succeeded the late Commander Masters as consul at Mozambique. Mr. O'Neill evidently made a very successful journey of 600 miles through country previously almost unknown, and his paper forms a contribution to geography which is of some importance, though it hardly comes up to our ideas of what a good geographical paper should be. The most telling part of it is that which deals with the manners and customs, &c., of the Makua race. Though it has been reported that Mr. O'Neill actually sighted the Wamuli Peak, said by the natives to be covered with perpetual snow, he himself distinctly says that, although its position was pointed out to him, he could not clearly distinguish it. To some future traveller, therefore, will fall the honour of actually being the first to see the snow-clad peak, if it really exists, though no doubt he will have been very nearly run by Mr. Maples on one side and Mr. O'Neill on the other. Towards the conclusion of his paper, Mr. O'Neill makes some useful observations on the commercial capabilities of the country traversed, from which it would appear that there is a good opening there for imports, but the economic products are at present few.

THE most important contribution in the March number of the Geographical Society's *Proceedings* is Mr. Last's account of his journey from Mamboia into the Nguru country, East Central Africa. On this occasion Mr. Last had his wife with him, and travelled, in a little over three weeks, some 250 miles, of which the whole of the region between Mguru and Kibauti was new to Europeans. Mr. Last sent home a rough map of his journey, on which he also laid down the roads and places passed in 1880, as most of them are not shown on previous maps of East Africa, and from this a map on the scale of nearly twelve miles to the inch has been prepared. There is an interesting note referring to Diego Garcia, the most southerly island of the Chagos Archipelago, and others on Mr. Colquhoun's expedition through Southern China and Burmah, and the journey of MM. Bouvalot and Capus from Bokhara to Krasnovodsk. The full text is also given of Lieut. A. W. Greely's report on the proceedings of the expedition to Fort Conger, Grinnell Land, the name he has given to the first of the international meteorological observatories in the Polar area.

THE Geographical Society have now ready for issue by Mr. Murray, Mr. E. Colborne Baber's "Travels and Researches in Western China," forming the first part of their *Supplementary Papers*, a publication which is to take the place of their annual *Journal*. The staple of the volume consists of Mr. Baber's journey of exploration in Western Szechuen, accompanied by various scientific observations and tables of latitudes and longitudes of numerous positions. The remainder of the volume contains reprints of a brief narrative of a journey to Ta-chien-tu, and notes on the route of the Grosvenor mission through Western Yunnan and on the Chinese tea-trade with Tibet. The maps are of great value, and consist of one showing the distribution of the Sifan tribes, a section of country along Mr. Baber's routes, and a large route-map of his explorations in Western China.

THE two last numbers of the *Izvestia* of the Russian Geographical Society contain a good deal of valuable information. M. Pevtsoff contributes a paper on his journeys in Mongolia, from the Altai to Kobdo, Kukukhoto, Kalgan, and back, *via* Urga and Ulasutai, with a map of the country; Dr. A. Woiehoff gives a *résumé* of the amount of cloud, observed during ten years' observations in Russian meteorological stations; A. E. Regel contributes a paper on his journey to Turfan in 1879; Lieut. Kalitin gives a description of the region explored between Akhalteke and Khiva, with a map; and MM. Yadrintseff gives an interesting account of the Tartars of Altai. There are, besides, a letter of A. W. Adrianoff, on his expedition in the Kuznetsk region, a list of heights determined by M. Potanin in Mongolia, information about the expedition of the *Jeannette*, of the *Alliance*, of the *Thomas Corwin*, and other small notices.

THE Russian Geographical Society is taking part in an expedition to Central Africa, under the leadership of M. Schultze-Ragotsinsky, and with the participation of M. Bianchi, Prof. Licati, M. Budilovitch, of the Russian navy, M. Bartoshevitch, of the St. Petersburg University, M. Tomsen, Windakovitch, and several others. The expedition proposes to explore the little-known parts of Equatorial Africa, between 1° and 10° N. lat., and 10° to 12° E. long. The expenses will be defrayed